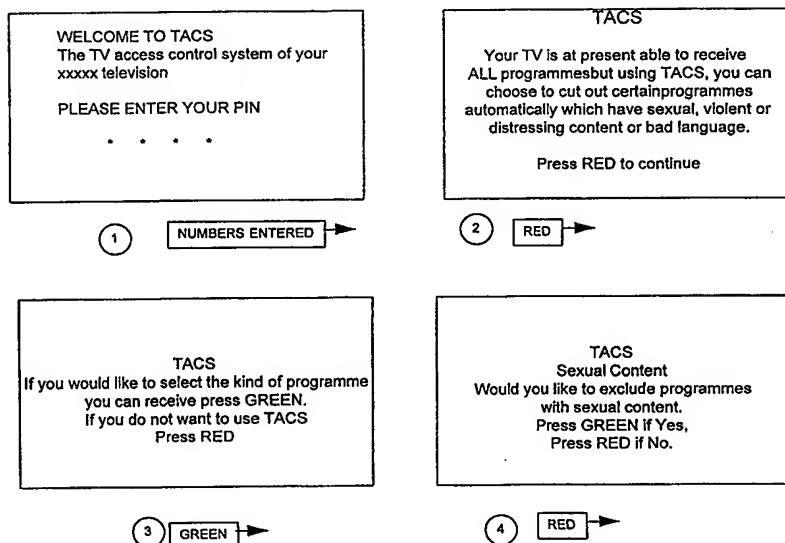




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(54) Title: INHIBITION OF A TV PROGRAMME DISPLAY ACCORDING TO THE CONTENTS**(57) Abstract**

A method of controlling the viewing of television programmes according to their content involves sending codes using an auxiliary data channel which indicate the level of sexual, violent, distressing, etc. content. These codes are assembled into a teletext signal and detected at a receiver. The receiver is programmed by entering corresponding codes which indicate allowable or forbidden content and cause the display to be blanked and the sound to be muted in dependence on the transmitted codes. The codes are additionally inserted in displayable form in a teletext page to enable a viewer without an automatic means of controlling the display of the programme to monitor the classification of a programme being viewed. A system, programme source and receiver are also described.

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DESCRIPTION

INHIBITION OF A TV PROGRAMME DISPLAY ACCORDING TO THE CONTENTS

5 The invention relates to a method of and apparatus for enabling the inhibition of television programme display in dependence on the programme content.

10 A law has been passed in the USA which requires that all television receivers having a display above a certain size sold from 1998 will have to have a means of enabling parents to prevent children from viewing coded programmes containing violence, sex, and bad language. A so called "V-chip" is proposed which will monitor a code transmitted with the television signal and disable the television receiver when the code indicates forbidden programme
15 material including scenes of violence, sex or other matter which might be considered objectionable by some audiences or unsuitable for children.

 In the US V-chip system, the broadcaster rates each programme in four censorship categories. The values for each category are then transmitted simultaneously as part of the extended data services (EDS) of the Closed
20 Captioning (CC) system. The values are transmitted for as long as the programme is on the air.

 Using an access control mechanism, the parent sets a threshold for each category. If a rating exceeds the pre-authorised value, the V-chip; suppresses the video and audio signals. As the reaction of the V-chip decoder is near
25 instantaneous, the system can easily handle channel hopping. Moreover, the parent does not have to worry about missing content warnings in TV guides or at the start of programmes.

 The Electronic Industries Association (EIA) defines the four censorship categories and the number of data bits required to transmit the code:

- 30 • MPAA rating (equivalent to film classifications, e.g. 18, PG, etc.) - 3 bits
- violence content advisory level - 2 bits (which allows for a scale of 0 to

3)

- sexual content advisory level - 2 bits
- mature content advisory level - 2 bits.

5 The same principles apply to a system being field-tested in Canada but, at present, the two are not identical.

All American TV sets built after July 1993 had to include a CC decoder to provide subtitling. Current CC decoders (such as the SAA5252 decoder sold by Philips Semiconductors) are capable of blanking out the TV picture when switched into full-text mode. They also have adequate display features to
10 generate an OSD menu so that parents can program the censorship thresholds.

Unlike teletext, CC data can be recorded and reproduced by a VHS VCR during play-back of a programme. Thus recorded and pre-recorded tapes could also contain censorship data.

15 In Europe, the question of implementing a V-chip type system is altogether more complex than North America. The broadcasters are not regulated by a single government, and cultural and language differences mean variance in acceptable moral standards. Then there are the technical issues of coping with a 625-line TV system that has little spare capacity for extra data signals.

20 The obvious solution is to use the American system but this has some disadvantages.

First, for broadcasters, the CC signal would occupy valuable teletext transmission capacity (one line would be permanently lost) and different encoding systems would be required

25 Secondly, it would be very expensive for broadcasters in terms of the duplicate transmission equipment and data bridges (in cable amplifiers) required for both teletext and CC signals.

30 Thirdly, consumer electronics manufacturers would have additional overheads in providing teletext and CC decoding in every TV set and PC TV card.

The concept of enabling a parent to control viewing of a television receiver using information transmitted by the broadcaster is not new and was proposed in W083/02208 published on 23rd June 1983. In that document it is proposed that a code is sent via the teletext signal transmitted with the television signal, the code being formed as a selected row number of a given teletext page. Thus the page number and row number is transmitted in the field blanking period on the occurrence of a possibly offensive event. At the receiver a teletext decoder is permanently set to look for the relevant page and identify the row number as and when transmitted. The particular row numbers indicated particular gradings of sound and vision events.

Clearly such an arrangement does not allow a viewer who has a set which includes a teletext decoder, but which does not include a means for inhibiting display in response to the row addresses sent on the given page, to determine the content of the programme in order to decide whether to view it or let persons (children) they are responsible for to view it.

A further proposal for controlling access to the viewing of television programmes is disclosed in UK Patent Application No. 9619878.3 (PHB34110) in which programme classification codes are sent as packet 8/30 format 1 data. These packets are independent of page transmissions and are transmitted frequently, at approximately 1 second intervals, so that the classification codes can be quickly updated, for example to suppress individual short passages which may contain undesirable visual or audible material. As these teletext packets do not contain displayable data it is not possible for viewers without the control system to obtain information easily as to the content of the programme currently being transmitted.

It is an object of the invention to enable an editorial function to be exercised over the output of a television receiver by a parent or other person in authority over that receiver.

The invention provides a method of enabling an authorised person to disable the sound and/or visual display of a television programme or a part thereof in dependence on the programme content, the method including the

steps of;

- i) classifying the whole and/or instantaneous content of a television programme,
- ii) generating code words representing the allocated classification,
and
- iii) inserting the code words in a teletext signal multiplexed with the television signal representing the programme in both a machine readable and a displayable form.

By providing the classification code words in both displayable and machine readable form use can be made of the classification of programmes by a viewer having a receiver which includes a teletext decoder but which does not include automatic means for disabling the display in response to codes set into the automatic means by the user and compared with the transmitted codes. Thus by the measure according to the invention of inserting the classification codes into both the displayable portion of the teletext data and ensuring that these codes can be detected and acted upon by automatic means, if provided, it is possible to disable the sound and/or visual display either automatically, if automatic means is included in the receiver, or by action of a supervising viewer if no automatic means is incorporated in the receiver provided only that it includes a teletext decoder. Thus the viewer can call up the programme classification page and monitor the classification of the programme currently being transmitted even if automatic disabling of the display is not available with the receiver being used.

An advantage of using the teletext transmissions to convey the code is that in many countries the infrastructure is already in place for inserting the teletext signal into the transmitted signal and that a large number of television receivers now incorporate teletext decoders. Thus there is a viewer demand for the teletext service and an editing facility can be relatively easily added to both at the receiver and at the programme originating source.

Thus to enable the disabling of the sound and/or visual display the programme provider monitors the content of the programme and provides an

appropriate indication of its content by means of a code inserted in an associated teletext signal. The person in control of the television set can then use this code to determine whether or not such programmes should be displayed (visually and/or orally). By using teletext packets to convey the code it is possible to produce a visual display of the codes in addition to the automatic inhibition of display, if automatic means are provided, or to produce purely a visual display of the codes if a receiver having only a basic teletext decoder is used.

Teletext pages are transmitted in sequence and consequently priority can be given to certain pages. Thus the repetition rate could be matched to the degree of the content, i.e. when high classification codes are present the page is sent more frequently. Consequently the classification can easily be changed frequently if desired. This enables the occasional occurrence of possibly offensive events to be edited out while still allowing viewing of the programme as a whole. For example, news and current affairs programmes may include distressing or offensive scenes, such as incidents from war zones, as relatively short portions of the programme as a whole. In addition the packet may be transmitted more frequently to enable even shorter events, such as a single word, to be deleted.

The displayable codes may be displayed at pre-determined positions on a teletext page, the machine readable codes then being the codes producing the displayable codes at the predetermined positions.

This has the advantage that only a single set of codes has to be transmitted, that is those which give the displayable information. This may be achieved by allocating a number of specific locations on the page for the display of the information relating to the classification of the programme. In this way at a receiver the received data can be analysed and it is known that the codes at the allocated positions on a display page define the programme classification. Consequently a control circuit may utilise this information to cause the display of the programme to be inhibited if the detected codes in the allocated positions on the page exceed stored codes set by the user.

In an alternative method the displayable codes can be freely placed on a teletext page and the machine readable codes are in predetermined locations on the page.

5 This gives the advantage of greater editorial freedom for the creator of the page, that is the displayable codes do not limit the layout of the displayed page, but requires the classification codes to be transmitted twice, once to enable display of the information and once for producing the machine readable codes. By separating the two functions greater flexibility in page layout can be achieved, for example the machine readable codes can be placed on a single
10 line such as line 1 which broadcasters frequently leave blank to separate the page title from the information on the page.

The machine readable codes may be concealed from display. In this way if row 1 is used there is still an undisplayed row between the page heading and the text on the display page.

15 In a further alternative embodiment the machine readable codes may be contained in an extension packet associated with the displayed page.

This gives all the advantages mentioned in our co-pending UK Patent Application No. 9619878.3 (PHB34110) but the additional advantages given by also transmitting displayable classification codes are retained.

20 The machine readable codes may be protected by an error correction code. With the method where the displayed codes and machine readable codes are identical they are protected only by a parity check. Current teletext decoders will automatically perform this parity check on all received characters in a page. If, however, the machine readable codes are concealed from display
25 it is possible to provide a greater degree of error protection for those codes. For example as disclosed in UK Patent Application No. 9619878.3 (PHB 34110) the machine readable codes in the extension packets, which will not be displayed, can be Hamming coded. Similarly if the machine readable codes are concealed on a given row of a page these can also be given greater error
30 protection than displayed codes without confusing the viewer.

Current teletext decoders, particularly the simpler ones, will only perform

a parity check on each character and if characters have different error protection codes the displayed character after a parity check will not be the same as the encoded transmitted character. Thus if these characters were to be displayed they would be meaningless or possibly confusing to the viewer.

5 The classification codes may be inserted in a current programme page which contains displayable information concerning the programme currently being transmitted.

 This page may be transmitted on a given page number which page number may be stored in non-volatile memory in the receiver so that it can be
10 accessed by pressing a single button on a remote control unit.

 The frequency transmission of the current programme page may be increased when any change of classification code takes place.

 As teletext pages are transmitted sequentially it is possible to allocate different priorities to different pages and thus any particular page can be
15 transmitted with a frequency determined by the broadcaster. Thus it is possible for the broadcaster to change the frequency of transmission depending on the content of the page. Consequently when a change of classification takes place a high priority for the transmission of the page can be allocated so that the delay in transmitting the page is minimal. This facility can be used to enable
20 inhibition of short passages or even individual words.

 The frequency of transmission of the current programme page may increase as the level of classification increases.

 The time taken to access a page decreases as the frequency of transmission increases, that is the page is transmitted at shorter time intervals.
25 Thus when a viewer requests a page the time taken for it to appear will be less than or equal to the interval between successive transmissions of that page. Thus if a higher classification code is transmitted the viewer will have a shorter maximum time to wait before receiving and displaying the page. This gives the advantage that a parent will be quickly informed if the programme contains
30 material unsuitable for viewing by children.

 The method may include the further step of generating error correction

bits for insertion in the packet with the code words. In one embodiment the code words are protected by means of a Hamming code, the code words being 4/8 Hamming coded.

5 This enables secure reception of the classification codes and consequently minimises the possibility of disabling or allowing display erroneously due to errors in transmission or detection of the classification code words.

One or more classification criteria may be each encoded using code words comprising two bits and an individual criterion may apply to the whole
10 programme or to individual events within a programme. The classification criteria may include one or more of; violent content, sexual content, distressing content, mature language.

The use of two bit code words for each criterion allows the setting of four possible levels for that criterion. For example taking the criterion of violent
15 conduct the code 00 could represent zero violent content, the code 01 a low level of violent conduct, the code 10 a medium level of violent conduct, and the code 11 a high level of violent conduct.

One of the code words may represent the region of origin of the programme, and the region of origin may be represented by a four bit code.

20

The indication of the region of origin of the programme may be useful in view of the sensibilities of different cultures. Thus what is offensive to one nationality or religious group may not be to another and consequently the possibility of modifying the meaning of a particular code depending on the
25 programme origin and the sensibilities of the controlling authority for the TV receiver could be useful. Thus certain communities may have a greater or lesser tolerance of sexual or violent conduct and by providing a region of origin code the level may be accordingly increased or decreased at the location of the receiver.

30 In one embodiment of the method an extension packet containing the code words may be inserted in the closest field blanking period to the beginning

and/or end of an event which changes the classification within the programme which is being classified.

Normally packet 8/30 format 1 is transmitted approximately once per second. In order to enable individual words, for example, to be disabled this is not sufficiently accurate but by causing the packet to be transmitted also in the closest field blanking interval it will be within 20 milliseconds of the occurrence of the offending word which will be sufficient to enable the word to be suppressed.

Alternative words to replace word(s) deemed unsuitable for a selected classification level may be provided.

These words may be transmitted on an auxiliary channel, for example that for the proposed Audetel service which provides an audio assistance signal for describing action in a scene.

The invention further provides a method of disabling the sound and/or visual display of a television programme, the method comprising the steps of;

- iv) establishing the authority of the user to define the programme or parts thereof which are to be disabled,
- v) entering into a memory within the television receiver code words corresponding to programme content it is desired to suppress,
- vi) receiving television signals including displayable code words and machine readable code words located in a teletext signal multiplexed with the television signals, the code words representing the programme classification,
- vii) comparing the received code words with the entered code words, and
- viii) disabling the sound and/or visual display in dependence on the result of the comparison.

The reception of television signals having an undesirable content for a potential audience, for example children, can be controlled using this method.

In addition the classification applied to the programme being viewed can be monitored by displaying a particular teletext page which contains the

classification codes in a form intelligible to a viewer. Thus the method allows the viewer to view on a standard teletext display page the classification of the programme and allows automatic disabling of the display of the programme if automatic means is included within the receiver.

5 The machine readable code words may be located in an extension packet of the teletext signal. This may be a page related extension packet such as packet 26 or a non-page related extension packet such as packet 8/30 format 1. A television set or video recorder equipped with a teletext decoder which is capable of detecting and decoding extension packets can be used to
10 monitor the classification of a programme according to its content and if a user enters a classification which it is desired to suppress then means can be provided to disable the output of a television set or the record function of a video recorder.

 Step iv) of the method may be accomplished by entering a Personal
15 Identification Number (PIN). Alternatively or in addition step iv) of the invention may be accomplished by monitoring a physiological characteristic of the authorised person.

 A relatively simple method of establishing authority is to issue a PIN which is known only to the authorised user. The entered PIN is then
20 compared with the stored PIN (known only to the authorised user) and if coincidence is found then the classification codes may be updated.

 The disadvantage of using a PIN is that it may be forgotten by the user or may be discovered by non-authorised users. An alternative which requires more complex equipment to implement is to monitor a physiological
25 characteristic of the user, for example fingerprints, voice, facial features, etc.

 The code words may be entered using a remote control unit.

 Remote control units are frequently provided with television sets and are invariably provided with television sets capable of receiving and displaying teletext data. They have a numeric keypad and thus can be used for entering
30 a PIN and also are provided with other keys whose functions can be used for entering the desired classification codes.

An on-screen display message may be generated to aid the entering of the code words.

By this means a step by step process of entering the codes relating to the different classification criteria can be guided by means of successive displayed instructions and choices.

An on screen display message which informs the viewer of the reason the sound or visual display is disabled may be generated.

Such a message will prevent a viewer from thinking there is a fault in the television set which is causing the display or sound to cease. The messages may, for example, be of the form "sound inhibited because of mature language", or "display inhibited because of distressing event."

An inhibited sound may be replaced with an alternative sound.

Thus an undesirable word or passage could be replaced by a "bleep" or other sound. This would ensure that the viewer realised that it was the control function that caused the word to be inhibited whereas it might be thought that there was a fault if the word was replaced by silence.

The alternative sound may be defined by the received signal.

Thus a range of sounds might replace the original words. For example, the replacing sound may depend on the length of the passage to be replaced. In a further example alternative non-objectionable words might be transmitted in an auxiliary channel to replace the words not allowed by the selected classification. Such alternative words may be transmitted, for example, using any spare capacity in the proposed Audetel service.

The invention further provides a television signal programme source including a teletext signal insertion arrangement, means for classifying television signals to be transmitted according to the programme content they convey, means for generating code words representing the classification allocated to the programme or part thereof, and means for inserting the code words within the teletext signal in both displayable form and machine readable form.

Many current television signal sources include a teletext inserter and

many service providers include a means for encoding extension packets which are not page related.

The teletext signal may be as defined in the World System Teletext Standard and the machine readable code words may be inserted in extension packet. The extension packet may be packet 8/30 format 1.

This extension packet is normally transmitted at approximately one second intervals and is not page related. It is decoded by many teletext decoders and includes information as to the programme provider, first page to be acquired, and a real time clock. There are four bytes within this packet which according to the invention are used for transmitting programme classification codes.

Means may be included for changing the classification within the duration of a single programme.

This enables the use of the classification code in two modes. The first is to prevent the reception of a whole programme deemed to be unacceptable and the second is to allow viewing of a programme but to delete possibly offending events. The length of events which can be excluded depends on the frequency of transmission of the codes. Packet 8/30 format 1 is normally transmitted once per second and thus events can be deleted easily in multiples of a second. In addition it is also possible to transmit additional packet 8/30s and this will allow a timing to the nearest field blanking period.

Means may be provided for error correcting the code words. The words may be protected by means of a Hamming code. The code words may be 4/8 Hamming coded.

By error protecting the code words the possibility of falsely inhibiting or allowing display of programmes or events within programmes due to errors in transmission are reduced.

The code words may comprise words defining the level of one or more of the following categories; sexual explicitness, violence, mature language, distressing images or sounds.

These categories may apply to either sound or vision and may apply to

the whole programme or to individual events within a programme. For example news programmes may portray high levels of violence in particular reports such as from war zones. They may also contain distressing content, for example pictures of starving people as a result of famine. Other examples of material which may be distressing to some viewers include the display of operations in medical programmes.

The code words may further include a code word indicating the region of origin of the programme.

Different regions and countries have differing conventions and material which is acceptable in one region may not be in a different region. Consequently what is considered a low level of violence in one region may be considered a medium or high level of violence in another region.

The invention still further provides a record carrier containing data representing a television programme, classification code words representing allocated classifications for the whole and/or instantaneous content of the programme, and an associated teletext signal; wherein the code words are contained in the teletext signal in both displayable and machine readable form.

This enables the classification and control of reproduction of pre-recorded media such as video tapes or optical discs which may be purchased by persons who the authorised person does not wish to watch them. That is, parents may consider their child's choice of video inappropriate. If the record carrier is classified in the same way as broadcast material the same control can be exercised over their viewing.

The teletext signal may conform to the World System Teletext Standard and the machine readable code words may be inserted in an extension packet. The extension packet may be packet 8/30 format.

The teletext signal may be converted into a multilevel code to reduce the bit frequency of the teletext signal, in which case, the record carrier may be VHS video tape.

As is well known a teletext signal cannot normally be reliably recorded and reproduced using a VHS video recorder because of its bandwidth

limitations. Various proposals have been made to overcome this problem one of which is disclosed in EP-A-0608960 (PHB 33832). In that application one line of teletext data is spread over five lines in the field blanking period. As a result not all of the teletext data can be stored and a selection of that data is necessary at the time of recording.

One of the uses for this arrangement is the recording of subtitles for the deaf which are normally transmitted on page 888. There may also be room for recording the classification codes in the same manner but this would, of course, further limit any other teletext information it might be desired to record.

A further proposal for recording teletext data on VHS tapes is disclosed in UK Patent Application No. 9605614.8 (PHB34056). In this proposal the teletext signal is converted to a multilevel code at a lower frequency. This enables all the transmitted teletext data to be stored and reproduced using a VHS recorder and consequently may be used to enable the classification codes in the extension packets to be stored on the tape.

The invention yet further provides a television receiver suitable for receiving and displaying television signals from such a television signal source or record carrier, the television receiver comprising a teletext decoder, means for extracting the machine readable code words representing the classification allocated to the currently received programme, means for displaying the displayable classification codes, means for entering information representing any programme classification which represents programmes whose display it is desired to inhibit, means for comparing the entered and received classification, and means for allowing or disabling display of the programme in dependence on the result of the comparison.

Thus codes corresponding to programmes or parts of programmes which it is desired to suppress are entered into a television receiver. Corresponding codes are received via the teletext signal and can be compared, within the receiver, with the entered codes to enable control of the display and audio output of the receiver. If the codes are included in teletext extension packets which are not page related such as packet 8/30 format 1, it is not necessary to

have a teletext decoder permanently looking for a particular page. Instead the teletext decoder can perform its normal function of acquiring user selected pages and it will automatically acquire the non page related extension packets.

5 Authorization means may be provided for allowing only an authorised person to enter the programme classification.

The authorization means may comprise means for entering a PIN, means for comparing the entered PIN with a stored PIN, and means for allowing the entry of programme codes if the stored and entered PINs are identical.

10 This provides an easy secure means for ensuring that only an authorised person, for example a parent, can alter the classification codes. It does, however, have the disadvantage that the code may be forgotten or compromised. In the first case it is then difficult to change the classification and in the second case an unauthorised person may be able to change the
15 classification.

Alternatively the authorization means may comprise means for monitoring a physiological characteristic of the authorised person, means for storing the monitored characteristic, means for requesting a change in the acceptable programme content, means for monitoring the characteristic in
20 response to the request, means for comparing the monitored and stored characteristics, and means for allowing alterations to the acceptable programme content in the event of a correct comparison.

Various physiological characteristics may be used, for example fingerprints, facial characteristics.

25 Fingerprint detectors are known from their proposed use with credit card verification at point-of-sale terminals. A means for recognising facial characteristics is disclosed in EP-A-0 551 941 (PHB33765).

The advantage of using physiological characteristics is that they are difficult to falsify and there is no need to remember PINs or other external data.

30 Means may be provided for generating an on screen display message to inform the viewer why the sound and/or display has been disabled.

This prevents the viewer from assuming there is a fault in the receiver when a programme cannot be received or is interrupted due to its classification.

Means may be provided for replacing unsuitable words with an alternative audio signal. The alternative audio signal may represent alternative unobjectionable words. The alternative words may be received as part of the television signal.

Thus where objectionable words occur they may be replaced, for example, by a bleep signal. Alternatively they may be replaced by an alternative unobjectionable word. One way of achieving this is by use of an auxiliary channel in which the programme generator transmits alternative words. An auxiliary channel which could be used is the proposed Audetel channel for transmitting audio assistance messages for the blind or partially sighted.

Means may be provided for disabling the sound and visual display if no classification code is received with the television signal.

This enables control of the reproduction of programmes which have not been classified. This may be either due to their age or because, for example a video tape, they originate from an illicit source. In particular, tapes which are highly objectionable may be produced without a corresponding classification code.

The above and other features and advantages of the invention will be illustrated by and be apparent from the following description, by way of example, of an embodiment of the invention with reference to the accompanying drawings, in which:-

Figure 1 shows a television system for carrying out a method according to the invention,

Figure 2 shows in block schematic form a television programme source according to the invention.

Figure 3 shows a scheme for code words for classifying programmes, the code words being inserted into a teletext extension packet.

Figure 4 shows in block schematic form a television receiver according
5 to the invention.

Figure 5 illustrates a process for programming the television receiver to operate according to the method of the invention,

10 Figure 6 illustrates possible on-screen display messages when the method is invoked, and

Figure 7 illustrates display screens where both displayable classification codes and machine readable codes are included in a display page.

15

Figure 1 is a block schematic diagram of a system in which methods according to the invention may be carried out. The system shown in Figure 1 comprises a television signal source 1, a television transmission medium 2, and a plurality of television receivers 3-1 to 3-n. The television signal programme source may be a normal television broadcast equipment, either
20 terrestrial broadcast or satellite broadcast or could be the programme source for a cable television network. The television programme source includes a teletext inserter and means for entering programme classification codes into a teletext signal in both displayable and machine readable form. The codes in
25 machine readable form may be sent within a display page of the teletext signal or may be sent in extension packets which will not be displayed. Alternatively the machine readable codes sent within the display page may be concealed from the viewer. The transmission medium 2 may take any convenient form for example it could be radio waves as broadcast by a terrestrial transmitter or a
30 satellite transmitter or could be a cable network for a cable TV system. The television receivers 3-1 to 3-n are connected to the programme source via the

transmission medium 2. A further possible programme source 1 is a video tape or disc on which a programme is recorded for replay by a video tape recorder or a video disc player in which the case the transmission link 2 may be simply the tape recorder or disc player and a cable connecting the tape recorder or disc player to the television receiver.

An embodiment of a television signal programme source according to the invention is shown in block schematic form in Figure 2. The television programme source comprises a source of video and audio signals 10 which may for example be a television camera whose video output is fed via a teletext inserter 11 to a transmission network 12. The audio output from the television signal source 10 is fed via a line 13 to a further input of the transmission network 12. A conventional teletext editing system 14 is connected to the teletext inserter 11 and has a further input which is fed from a TV access control equipment 15.

The TV access control equipment 15 is arranged to insert into the teletext signal code words classifying the content of the television programme being created by the signal source 10. These code words are in both displayable and machine readable form. The TV access control equipment 15 has a first input 16 which receives data from a TV programme scheduling system. This data will for example provide an overall indication of the content of the programme which can be used to inhibit display of that programme at a receiver. The information may for example define the levels of violence, sexual content, mature language or distressing content which may occur in the programme.

The TV access control equipment 15 has a second input 17 which receives data from pre-recorded material. Pre-recorded material may already include the coding to indicate the type of content present in the programme and may also include instantaneous data to classify particular events during a programme. A keyboard or other input device 18 is connected to a further input of the TV access control equipment 15. This is to enable an operator to insert appropriate classification codes into a live programme. It is of course

necessary to delay the actual transmission of the programme by a short period so that there is time for the operator to enter the appropriate codes at the appropriate times. Such transmission delays are well known for live programmes to enable the broadcasting authority to cut out any undesirable occurrences. For example in live phone in programmes to cut out any libellous or obscene comments made by a person phoning in.

The codes generated by the TV access control equipment 15 or received by it and passed to the teletext editing system are then inserted into the teletext signal. The machine readable codes may also be the displayable codes or may be sent separately either at different positions on the display page or in extension packets which may or may not be page related. In particular the machine readable codes may be inserted into selected bytes of the packet 8/30 format 1 or in selected triplets of packet 26.

Figure 3 shows the content of packet 8/30 format 1 modified to enable the machine readable codes to be inserted. Thus it comprises a clock run in period and framing code and bytes containing information identifying it as packet 8/30, as format 1, defining an initial page, a network identity, a time offset, modified julian date and coordinated universal time. There are then four bytes available which are, according to the invention, used to transmit classification codes for the programme. There are then further bytes defining status display.

Four bytes give essentially 32 bits which may be used for encoding data. It is desirable that the classification codes are sent reliably since it would be extremely annoying to a viewer if the programme was interrupted because of faulty reception of the classification codes. This error protection will of course reduce the number of data bits available for encoding the classification codes. In an embodiment according to the invention these four bytes are used to transmit 16 message bits which are 4/8 Hamming coded for error protection. A proposal for allocating these message bits is as follows:

2 bits for sexual content of the whole programme

2 bits for sexual content of individual events within a programme

2 bits for violence content within a programme

2 bits for violent content of incidents within a programme

2 bits for distressing incidents within a programme

2 bits for mature language within a programme and

5 4 bits for an indication of the region of origin of the programme.

The allocation of two bits for each of the programme content classifications allows four possible levels to be set for that particular content. For example the code 00 could mean no content of that type, the code 01 a low level content, the code 10 a medium level content, and the code 11 a high content level. It is considered useful to have a coding as far as sexual and violent content is concerned for the whole programme and for individual incidents within a programme. Thus for example a parent could decide that programmes having a low or medium sexual content level could be viewed by children so long as the individual events containing sexual content were inhibited. Thus they would set the acceptable programme level to 01, while they may wish to eliminate incidents having sexual content altogether and thus set the event within the programme code to 00. The same considerations apply to violent content within a programme. The distressing content classification is likely to be only of limited duration within a programme. The types of content which are being considered here are for example details where in medical programmes operations are being shown. In this case viewers may well be interested in the medical techniques but find the portrayal of operations distressing. Other instances where distressing content may occur is in news or current affairs programmes. For example interviews with recently bereaved persons may be distressing to some people or pictures showing the effects of famine or other disasters. The mature language content of a programme will normally also be fairly intermittent and hence it is considered that the proscribing of a whole programme on that basis is perhaps not appropriate and that the instances which the mature language occurs can be suppressed.

30 The region of programme origin code is considered useful in that different areas and countries have different moral codes and consequently what

may be classified as a low level of violence in one region may be classified as a medium or even high level of violence in another region. The same considerations may well apply to sexual content and also distressing or mature language content. It would be possible within the receiver to modify the codes
5 for sexual, violent, distressing and mature language content in accordance with the code for the region of origin of the programme. Thus in region 1 medium level sexual content may correspond to high level sexual content in region 2.

It is also possible to bar programmes originating from a given region, for example for political or religious reasons.

10 UK Patent Application No. 9619878.3 (PHB33410) discloses such a method and system in which the classification codes are inserted into an extension packet of the teletext signal, in particular packet 8/30 format 1. This extension packet is not page related and is transmitted frequently, at approximately one second intervals in the UK. This is a convenient method of
15 achieving parental control when a TV receiver includes an appropriate decoder and control circuit. At present, however, and for some considerable time into the future many installed television receivers will not have such a control circuit but most will include at least a basic teletext decoder.

The present invention therefor provides that the classification code for
20 each programme is also inserted in a displayable form on a selected teletext page and that in some embodiments a machine readable version is associated with the selected page. The present exemplary embodiments disclose three possible forms that this association can take.

In the first example the classification codes both for display and
25 detection by the control circuit occupy predetermined positions on the displayed teletext page. As shown in Figure 7a there are four classifications, i.e. language content, sexual content, violent content, and age classification. These are always located at columns 20 and 21 of rows 20, 21, 22, and 23. Consequently the control system can detect and interpret the data at these four
30 locations and use it to allow or inhibit the display in dependence on the level set by the authorised person. This particular embodiment has the

disadvantage that it reduces the editorial freedom of the page editor and may limit the amount of information which can be displayed on the page.

The second embodiment is illustrated in Figure 3b and includes in row 1 the classification codes preceded by a conceal character (c_L). Row 1 is often displayed as a blank row to separate the main body of the text from the page header and in these circumstances may be used to contain the machine readable classification codes without imposing significant editorial restrictions. In addition by concealing the codes it is possible to adopt procedures to increase the reliability of the data. It will be appreciated that in the first example the classification codes are protected only by a single parity bit. In this example the rating values may be transmitted as data which passes the 8/4 Hamming check. Single bit errors can then be detected and corrected and double bit errors detected and rejected.

Table 1 shows the rating value, transmitted value, and displayed character for embodiment 1 which is illustrated in Figure 7a while Table 2 shows the rating value, transmitted value, and the displayed character (in the absence of the conceal character) for embodiment 2 which is illustrated in Figure 7b where the values are transmitted using the 8/4 Hamming check.

TABLE 1

Rating value	4	2	5	18
Transmitted value	34H	32H	B5H	31H, 38H
Displayed character	4	2	5	18

TABLE 2

Rating value	4	2	5	18
Transmitted value	64H	49H	73H	49H, 02H
Displayed character	d	e	s	1, graphics green

From Table 2 it can be seen that the machine readable code no longer results in a display which can be easily interpreted visually. A problem with this arrangement is that it can lead to the transmission of codes which terminate the action of the conceal attribute, for example graphics green. A possible means
5 of preventing this resulting in the control codes becoming displayed is to insert a conceal attribute (transmission code 98H) after each character.

In the third embodiment the machine readable ratings data is sent via triplets in extension packets 26. This has the advantage of increased robustness and avoids all editorial complications because it can be guaranteed
10 that the machine readable data will be hidden. The data in the triplets in packet 26 are protected by 24/18 Hamming code which allows single bit errors to be identified and corrected and double bit errors to be identified and rejected. The recently issued Enhanced Teletext Specification has a number of unallocated triplets. If the row address triplet with mode value 01110 was
15 allocated for this purpose eleven bits could be used for rating data. This embodiment could be used to extend the PDC protocol for video recorders. To simplify programming of VCRs Teletext TV listings pages carry machine readable data in packets 26 which can be loaded into a VCR to control the recording of a programme in conjunction with data broadcast in packet 8/30
20 format 2 to define the identity of the current programme. By adding the ratings data to the PDC data it is possible to check the rating when an attempt to record a programme is made and to inform the viewer whether the rating of the programme is such that the recording facility will be inhibited.

A fourth possibility is to transmit the machine readable code in packet
25 8/30 format 1 as proposed in UK Patent Application No. 9619878.3 (PHB34110) and to display it in viewable form on the selected page. As with the other embodiments a viewer with a teletext decoder, but without a control system for inhibiting the display will be able to monitor visually the rating of the programme and decide whether to manually switch off the television receiver or prevent
30 recording by a VCR.

Clearly it is not essential that the machine readable codes are sent in

direct association with the selected page. The machine readable code may be sent for example in extension packet 8/30 format 1 which is not associated with any particular page while the displayable codes are sent on the selected page. As with the other embodiments a viewer with a teletext decoder, but without a control system for inhibiting the display will be able to monitor visually the rating of the programme and decide whether to manually switch off the television receiver or prevent recording by a VCR. While there is no direct association between the selected page and packet 8/30 format 1 it is clear that the broadcaster will update both at the same time.

One advantage of sending the machine readable codes within the display page is that some broadcasting authorities have no facilities for transmitting extension packets and hence if they are to broadcast the machine readable codes they have to be sent within the display page

Figure 4 shows in block schematic form an embodiment of a television receiver according to the invention. As shown in Figure 4 the television receiver comprises an aerial 20 which feeds a conventional tuner 21 and IF and demodulator block 22. A combined video and blanking signal is available at the output of the block 22 and is fed to a teletext decoder 23 and a colour decoder 24. The output of the colour decoder 24 is fed to a video selector 25 which also receives a display signal output from the teletext decoder 23 and a blanking signal via an ORgate 26 from the teletext decoder 23.

A control processor 27 controls in conventional fashion the operation of the television receiver. It receives control instructions from a remote control unit 28 which the viewer uses to select a particular channel for display and selects other functions such as teletext display or on screen menu displays. The processor 27 will receive from the teletext decoder 23 the codes which are present in the packet 8/30 format 1, that is the codes representing the content of sexual matter, violent matter, distressing matter or mature language. It will also store within a non volatile memory 29 codes, which have been entered by the user using the remote control unit, which set the levels of sexual, violent, distressing or mature language content which are acceptable for display. The

processor 27 will compare the received codes with the stored codes and depending on the output of that comparison will produce a signal on line 30 which is fed to the video selector 25 via the ORgate 26 and which in appropriate circumstances will cause the video display to be blanked. It will
5 also feed a signal via a line 31 to an audio selector 32 which will cause the audio output to be muted in appropriate circumstances.

The audio selector produces an output which is fed to the standard audio circuits represented by block 33 and to a loudspeaker 34, while the video selector 25 produces an output which is fed to standard video circuits 35 and
10 to a display device 36. The audio selector 32 has a further input fed from a terminal 37 to which an alternative audio source may be connected. This may be for example a tone generator which replaces any offending words by a bleep or it may be connected to an auxiliary channel for example an Audetel channel to provide alternative words for the offensive words. The Audetel
15 channel is a channel proposed for use for providing an audio assistance signal which provides a description of the scene to help the following of a programme by persons unable to see the display screen clearly or at all, for example blind or partially sighted persons. There will normally be some spare capacity on this channel which will enable an alternative word for possibly offensive words
20 to be transmitted by the broadcaster or to be encoded within any programme source since Audetel will be idle while there is dialogue.

Figure 4 shows a television receiver but the invention could equally well be applied to a video recorder. In that case the outputs of the audio and video selector circuits 32 and 25 would be fed to record heads on the video recorder.
25 Thus only programmes having the authorised codes would be recorded on the video recorder. An alternative arrangement for a video recorder would be to allow recording of the received television programme regardless of the classification codes associated with it, but to record those codes on the tape so that on replay the television receiver is able to react to the output from the
30 video recorder in the same way that it would react to a broadcast programme. In this way a programme can be recorded for viewing by a number of different

persons, each of whom may have a different allowable classification level for particular content. Thus a whole programme may be played back through one television receiver, but only a restricted version through another.

Figure 5 A-E illustrates an on screen display sequence which enables
5 a person to enter the codes into a television receiver. On initial switch on the on screen display sets out a message which invites the user to enter a personal identification number. This is assuming that authorization is checked by means of a PIN. The PIN may be burnt into a memory by the manufacturer who then informs the buyer of the number of the PIN so that the owner can
10 initiate the selection of the classification. An alternative is to set the PIN to all zeros at the factory and for a routine to be entered into when the set is first switched on to change the PIN to any number that the user desires. Subsequently when it is desired to change the classification a key to request this is pressed on the remote control unit. This brings up the on screen display
15 message which invites the user to enter the PIN. This is shown as screen 1 in Figure 5A.

The user then enters the PIN and if this is checked correctly the next on screen display is presented. This is numbered 2 in Figure 5A. Initially the television receiver will be set to receive all programmes but by using the
20 television access control system a choice can be made as to whether programmes of a certain type are to be excluded. The on screen display instructs the user which key to press to continue the process, in this instance the red key. The next screen presented, screen 3, invites the user to either press a green key to select the type of programme that can be received or to
25 press a red key if he wishes to leave the state unchanged. Assuming that the green key has been pressed the fourth screen is presented. This invites the user to decide whether programmes with sexual content should be excluded and invites the user to press one button if such matter is to be excluded and a different button if the matter is not to be excluded. Assuming that the user
30 would like to exclude at least some of the sexual content then screen 5 is presented. This will invite the user to exclude either high levels, moderate or

high levels or any level. In this particular example the user chooses to exclude high levels only. In this particular instance the user who has chosen to exclude high level only sexual content and is then invited to indicate whether this content should be excluded only when the events occur or whether all
5 programmes which include high levels of sexual content should be completely excluded. Again the user is invited to press red in one instance and green in the other. That completes the programming for sexual content.

A similar process is followed for violent content and is shown on screens 7, 8 and 9. Screens 10, 11 and 12 show the process for enabling distressing
10 content to be excluded. In this particular case it is only excluded for the events in which the distressing content is present and not for the whole programme. It is considered that distressing content is unlikely to be relevant to a whole programme but only to events within a programme. Such distressing content may be for example the showing of operations in medical programmes or the
15 showing of the scenes of accidents or other disasters in news programmes. These incidents will only be a small portion of such programmes and the programmes can be enjoyed readily with those incidents deleted.

A similar process is shown in screens 13 to 15 which enables the programming of the mature language content which is acceptable. Again this
20 only excludes the specific events rather than the programme as a whole since the occurrence of possibly offensive words is likely to be only a small proportion of the programme as a whole especially if programmes having excessive sexual or violent content are already excluded. Screens 16 and 17 illustrate the programming of the region of origin. It enables the user to
25 exclude programmes from certain regions if desired. This may be desirable for example where a particular country is transmitting propaganda material which may not contain excessive sexual content or violent content or even distressing content or mature language, but the authorised person may wish to prevent reception of programmes of such a nature. An alternative use for the
30 region of origin codes is to modify the effective codes for sexual, violent, distressing content or mature language depending on the source of the

programme. Thus from region A it may be desired that the level of sexual content accepted is moderate level only because what is considered moderate in region A may be considered to be high in the region where the receiver is located. This code of changing may be programmed permanently into the receiver or may be settable by the user. Screen 18 is the final screen presented and confirms the choices which have been made by the user. This screen is similar in content to screen 2 which is presented when the entry to the access control system is obtained. Thus once a setting has been made this will be displayed on screen 2 at a subsequent access.

It will be apparent that these on screen display messages are by way of example only and that the actual messages may be tailored for particular markets and will of course be in the language of the country in which the set is located. The control processor may, of course, store various on screen displays in a number of different languages, the language choice being made by the user when accessing the on screen displays thus enabling a common control processor to serve sets sold in various different countries.

Figure 6 shows examples of on screen messages which are displayed when the access control system is in operation. Thus, the first screen shows that the programme is not available and states that it is due to high levels of sexual content. This message will of course vary according to the reason for non availability of that particular programme and is defined by the coding associated with it. The second screen shows that the television is temporally blanked due to moderate violent content. Thus, during most of the programme the display will be available, but there is a temporary blanking of the visual display to prevent the viewer seeing violent content. The third screen shows similarly that the display is temporally blanked due to distressing content. The fourth screen shows the picture displayed with a message superimposed upon it stating that the sound has been muted because of mature language.

Consequently, since the viewer is informed that the sound is temporally muted he or she will not assume that there is a fault with the sound channel of the television receiver.

In the particular examples described authorization of the user able to change the coding has been by means of a PIN. There are however various other ways in which a user can be authorised. One possibility would be a fingerprint detector so that it would be necessary for the user to place his or her hand or fingers on a detector pad which compare the fingerprint with one stored in the receiver. This would avoid any problems of forgetting the PIN or the PIN being compromised, for example one of the children discovering the PIN and resetting the classification codes. A further possibility is to include a video camera on the receiver which will look at the face of the person wishing to change the code. The output of the video camera can be compared with a stored image within the receiver and if coincidence is found then updating of the classification code can be allowed. The latter two methods may be used for example when a personal computer is fitted with a TV programme receiver facility. The necessary processing circuits for the fingerprint or face recognition will then be within the personal computer circuits.

Television broadcasters will often inform viewers about the suitability and content of a programme immediately prior to the start if they feel certain viewers may be upset or distressed by aspects of the programme. However, if a viewer starts watching the programme after it has started he or she may be unaware that such warnings or other information were given.

Teletext services provide information on a wide variety of subjects, including TV listings and TV programme-related material. Frequently the Teletext service provider will also be the TV programme provider and thus will have detailed knowledge of the content of the TV programmes. Warning information regarding the suitability and content of a particular programme can be broadcast as part of a TV listings page, or as part of a page providing a detailed description of a particular programme. Further, it is possible to transmit this information when it relates to the current "on-air" programme on a dedicated page number so that the viewer only has to remember one page number to check the details of the current programme. Which ever method is employed, the suitability and content information can be available all the time

the programme is being broadcast.

The use of a dedicated page number suffers from the disadvantage that the viewer is likely to have to remember a different page number for each channel he can receive. Further, it does not guard against the possibility of the service provider re-organising his database and allocating the warning page to a different page number. Also, it is not reasonable to expect every Teletext service provider to agree to using the same page number. This would interfere with their editorial freedom to construct a database using groups of page numbers for certain categories and sections. Some Teletext service providers do not have access to the full range of possible page numbers. Their franchise or licence provides them with the use of certain page numbers only.

One possible solution is to store the relevant page number for a given channel in a non-volatile memory within the receiver but this requires action from the viewer and this may be difficult to accomplish in a straight-forward manner. However, if this was achieved the viewer could be provided with the means to display the page with a single remote control button push at any time and/or the TV receiver could be designed so that the page was displayed automatically after a change of channel, but this still does not guard against viewer loss due to the broadcaster changing the page number. Also, the system could be configured so that the page was displayed automatically when it first appears in the transmission (in the case where it is transmitted only when the broadcaster considers that a warning should be issued), or was updated on a change of programme. The setting of the Update control bit (C8) in the page header can be interpreted as flag indicating the contents have changed.

In the recent Enhanced Teletext Specification a special type of Teletext page - a Magazine Inventory Page (MIP) - is specified. This page indicates the function and content of the other pages in the magazine in which the MIP is transmitted. An eight bit value (transmitted as two 8/4 Hamming coded bytes) is sent for each possible three-digit page number (m00 - mFF). One such category is TV programme related warning page (code 7AH). This is a single

page (i.e. it is not a rotating page) and it is intended to give a visual, readable indication of the suitability and content of a programme.

A suitable decoder can search the Magazine Inventory Pages on each channel and note in non-volatile memory the page number of the TV programme related warning page. Thus there would be no need to expect user interaction to configure the system as set up is automatic for channels broadcasting a MIP containing appropriate data. A check may be made at periodic intervals to establish that the stored page number is still valid. Once the page number is established any or all of the techniques outlined previously (single button access, display on update, display on appearance and display on channel change) can be offered.

The system outlined so far provides human-readable information on a standard teletext page about the suitability and content of a TV programme. The invention extends this to allow access to a programme to be restricted. This requires, machine-readable data to be transmitted, in some embodiments as part of the page, so that receiving equipment can be controlled. The machine readable data should preferably include error protection to ensure reliable data as a viewer would soon become annoyed if spurious blanking of a programme occurred. Such data can define ratings for the content of the programme in a number of categories, e.g. mature language, sexual, violent content, etc. In addition, it might recommend a minimum viewing age. Thus the information presented visually is defined in a qualitative manner.

The ratings data can be interpreted by a suitably equipped TV and the display of picture and sound can be inhibited if threshold limits are exceeded. In this way a parent can prevent a child from watching a particular programme, or type of programme, the parent deems unsuitable. Further, by incorporating a suitable decoder in a VCR, the recording of programmes considered unsuitable can be prevented. The TV or VCR would have a user interface which allows the parent to set or change the thresholds having first entered an identification code (PIN number).

It will be some considerable period of time before all TV and VCR receivers have the ability to be controlled in this way. However, it is desirable to provide the suitability and content information to as many receivers as soon as possible and this is readily achieved by linking the access control data to a visual description on a Teletext page.

The machine-readable data can be added to the TV warning page in a number of ways. For example as codes embedded within the display part of the page (packets 1-23), or in page-related extension packets (packets 24-28). The latter method is likely to be more robust as the coding scheme employed by some of the extension packets is more heavily protected against transmission path errors through the use of Hamming coding. However, some transmission systems are not capable of carrying extension packets and in that case the parity protected data of the normal display packets has to be used.

A normal teletext page uses packet 0 to convey Hamming protected control data for the page number and various display attributes of the page. It also includes text to appear at the top of the page, usually defining the page number, date and service provider in a directly displayable form, plus the local time. Conventionally, the rest of the directly displayable part of the page is transmitted via packets 1 to 23, with packet 24 used in some transmission schemes to provide an extra display row to simplify navigation around the database.

By establishing an agreed format for the TV warning page the location of the various codes used to convey the different ratings can be defined. Thus a suitable decoder would know from where to read the data to determine whether the programme is allowed to be presented on the TV screen or recorded via the VCR. A code of practice between broadcasters and manufacturers to establish the format and layout of the page would be desirable in implementing the invention.

In the example shown in Figure 7a below, the language rating can be found in packet 20 at column 21, the sexual content rating in packet 21 at

column 21, the violent content rating in packet 22 at column 21 and the age classification in packet 23 at columns 20 and 21. In this implementation the display data is also the machine-readable data and no additional codes have to be transmitted.

5

Although this simple system meets the basic requirements for conveying content ratings it does require a certain format of page which imposes editorial constraints and this may not be acceptable to all Teletext service providers.

As extension of the proposal the rating data could be encoded on a given row. As the machine readable data may not make any sense to the viewer it may be desirable to inhibit its display in some way such that the row appears empty. A number of possibilities exist:

- by inserting the display control attribute *Conceal* before the sequence. Two consecutive *Conceal* codes could be used for added robustness if thought desirable.
- if the page was designed in the subtitle/newsflash format, the ratings data would not need to be preceded by *Start Box* attributes and consequently would not be displayed.
- setting background and foreground colour to be the same colour.
- inserting the data in the row immediately below a row containing a *Double Height* control attribute.

For a practical system a code of practice would be required to define the row, the sequence of the rating data and possibly the method of hiding the data. This method imposes far fewer editorial constraints than the arrangement shown in Figure 7a. Apart from the designated row the rest of the page can be organised in any way the editor desires.

By way of example, row 1 is often displayed as a blank row to separate the main body of the text from the page header and could be allocated for this purpose. Figure 7b illustrates how the ratings presented visually in rows 20 to 23 are entered in sequence after the Conceal control attribute (C_L) in row 1.

30

In this example the value adopted for a particular rating is the value that would be displayed on the screen if the transmitted code was displayed on TV screen via the display circuits for the Teletext decoder.

Transmitted value:	34H	32H	B5H	31H, 38H
Rating value:	4	2	5	18

Alternatively, and if required by the chosen coding scheme, values between 10 and 15 could be presented in a hexadecimal format (e.g. A to F) and values in the range 16 to 255 by two hexadecimal coded values.

It should be noted that this embodiment allows a number of categories to be included until the complete row has been filled. New categories can be added at the right hand end of the sequence at a later date and compatibility will be maintained with earlier decoders.

Also, the minimum requirements for the page are a page header and packet 1 although the viewer might be confused if he was presented with this page having perhaps used a dedicated remote control button to select the *TV warning* page. Instead, if the broadcaster wanted to supply the access control data without any accompanying text he could allocate a page number with both page units and page tens set to hexadecimal digits. A code of practice could then define this combination as a page having the access control data but no directly displayable content. A page number with a single hex digit could identify a page with access control data AND displayable content but which should only be selected automatically in response to dedicated remote control buttons, channel change, update, etc. Only if the page units and page tens components of page number were both in the range 0 to 9 would the page be directly accessible to all Teletext viewers through the normal page selection mechanism of entering three digits.

This revised embodiment meets the requirements of the required system but may not be considered to be particularly robust as the data to control access to a programme is protected only by parity coding, allowing a single bit error to be detected but not corrected. A decoder should be designed to

inspect several successive receptions of the data and integrate the result before concluding the ratings for the current programme.

This reliability of the data on the allocated packet can be improved by transmitting the ratings values as data which passes the 8/4 Hamming check.

5 Single bit errors can be then be detected and corrected and double bit errors detected and rejected. The Hamming decoded value represent the ratings value.

Rating value:	4	2	5	18
Transmitted value:	64H	49H	73H	49H, 02H
10 Displayed character:	d	I	S	1, graphics green

Note that this no longer results in a display which can be interpreted visually. Also, this can lead to the transmission of codes which terminate the action of the Conceal attribute, e.g. graphics green. To overcome this a Conceal attribute (transmission code 98H) may be inserted after each element
15 if this was the chosen method of hiding the data:

Rating value:	4	2	5	18
Transmitted value:	64H,98H	49H,98H	73H,98H	49H,98H,02H, 98H

Simpler decoders have no option than acquire the data and check it as if it was parity coded. They would then need to apply the received data to a
20 look-up, or reference table, to establish the actual ratings values. More sophisticated decoders, where the processing and checking performed on any byte is more flexible, could perform Hamming 8/4 checking straight away.

For increased robustness to and avoid all editorial complications because the machine-readable ratings data would be guaranteed to be hidden,
25 the data could be sent via triplets in extension packets 26. These are coded Hamming 24/18, allowing single bit errors to be identified and corrected, and double bit errors to be identified and rejected.

The recent Enhanced Teletext Specification has a number of unallocated triplets. For example, allocating the row address triplet with mode value of
30 01110 can supply 11 bits for rating data:

Address bits:	11xxxx	N.B. Setting the 2 MSBs to 1 ensures
---------------	--------	--------------------------------------

a "row triplet" is seen

Mode bits: 01110
Data bits: xxxxxxx

5 The above scheme using packet 26 triplets can be used to extend the
PDC protocol. To simplify programming of VCRs Teletext TV listings pages
can carry machine-readable data in packets 26 that can be loaded into a VCR
to control programme recording in conjunction with a packet 8/30, format 2
broadcast to define the identify the current programme. By adding the ratings
10 data to the PDC data, a VCR can check the rating when a programming
request is made and inform the viewer if the programme will not be able to be
recorded because of the thresholds currently set in the VCR.

15 From reading the present disclosure, other modifications will be apparent
to persons skilled in the art. Such modifications may involve other features
which are already known in the design and use of television systems and
component parts thereof and which may be used instead of or in addition to
features already described herein. Although claims have been formulated in
this application to particular combinations of features, it should be understood
20 that the scope of the disclosure of the present application also includes any
novel feature or any novel combination of features disclosed herein either
explicitly or implicitly or any generalisation of one or more of those features
which would be obvious to persons skilled in the art, whether or not it relates
to the same invention as presently claimed in any claim and whether or not it
25 mitigates any or all of the same technical problems as does the present
invention. The applicants hereby give notice that new claims may be
formulated to such features and/or combinations of such features during the
prosecution of the present application or of any further application derived
therefrom.

CLAIMS

1. A method of enabling an authorised person to disable the sound and/or visual display of a television programme or a part thereof in dependence on the programme content, the method including the steps of;
- 5
- i) classifying the whole and / or instantaneous content of a television programme,
 - ii) generating code words representing the allocated classification, and
 - 10 iii) inserting the code words in a teletext signal multiplexed with the television signal representing the programme in both a machine readable and a displayable form.
2. A method as claimed in Claim 1 in which the displayable codes are displayed at pre-determined positions on a teletext page and the machine readable codes are the codes producing the displayable codes at the predetermined positions.
- 15
3. A method as claimed in Claim 1 in which the displayable codes can be freely placed on a teletext page and the machine readable codes are in predetermined locations on the pages.
- 20
4. A method as claimed in Claim 3 in which the machine readable codes are concealed from display.
- 25
5. A method as claimed in Claim 1 in which the machine readable codes are contained in an extension packet associated with the displayed page.
6. A method claimed in Claim 4 or Claim 5 in which the machine readable codes are protected by an error correction code.
- 30

7. A method as claimed in any preceding claim in which the classification codes are inserted in a current programme page which contains displayable information concerning the programme currently being transmitted.

5 8. A method as claimed in Claim 7 in which the frequency of transmission of the current programme page is increased when any change of classification code takes place.

9. A method as claimed in Claim 7 or Claim 8 in which the frequency
10 of transmission of the current programme page increases as the level of classification increases.

10. A method as claimed in any preceding claim comprising the step
of providing alternative words to replace word(s) deemed unsuitable for a
15 selected classification level.

11. A method of disabling the sound and / or visual display of a television programme, the method comprising the steps of;

- iv) establishing the authority of the user to define the programme or
20 parts thereof which are to be disabled,
- v) entering into a memory within the television receiver code words corresponding to programme content it is desired to suppress,
- vi) receiving television signals generated by a method as claimed in any preceding claim ,
- 25 vii) comparing the received code words with the entered code words, and
- viii) disabling the sound and / or visual display in dependence on the result of the comparison.

30 12. A television signal programme source including a teletext signal insertion arrangement, means for classifying television signals to be transmitted

according to the programme content they convey, means for generating code words representing the classification allocated to the programme or part thereof, and means for inserting the code words within the teletext signal in both displayable and machine readable form.

5

13. A record carrier containing data representing a television programme, classification code words representing allocated classifications for the whole and / or instantaneous content of the programme, and an associated teletext signal; wherein the code words are contained in the teletext signal in both displayable and machine readable form.

10

14. A television receiver suitable for receiving and displaying television signals from a television signal source as claimed in Claim 12 or a record carrier as claimed in Claim 13 the television receiver comprising a teletext decoder, means for extracting the machine readable code words representing the classification allocated to the currently received programme, means for displaying the displayable classification codes, means for entering information representing any programme classification which represents programmes whose display it is desired to inhibit, means for comparing the entered and received classification, and means for allowing or disabling display of the programme in dependence on the result of the comparison.

15

20

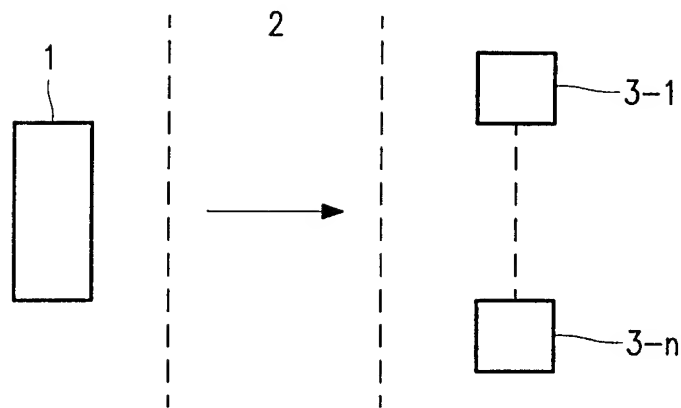


FIG. 1

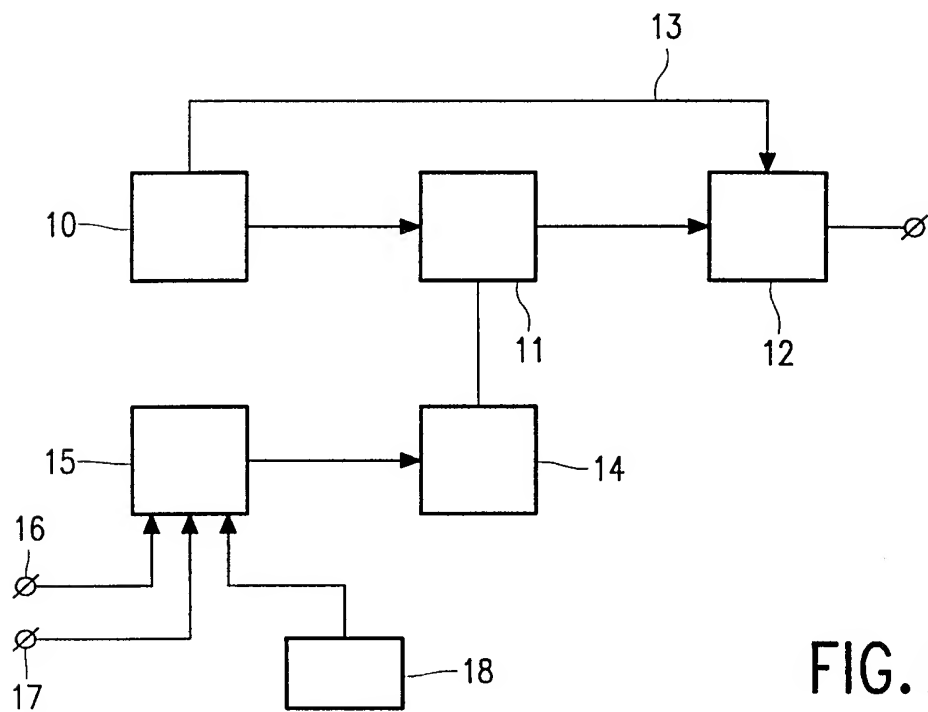


FIG. 2

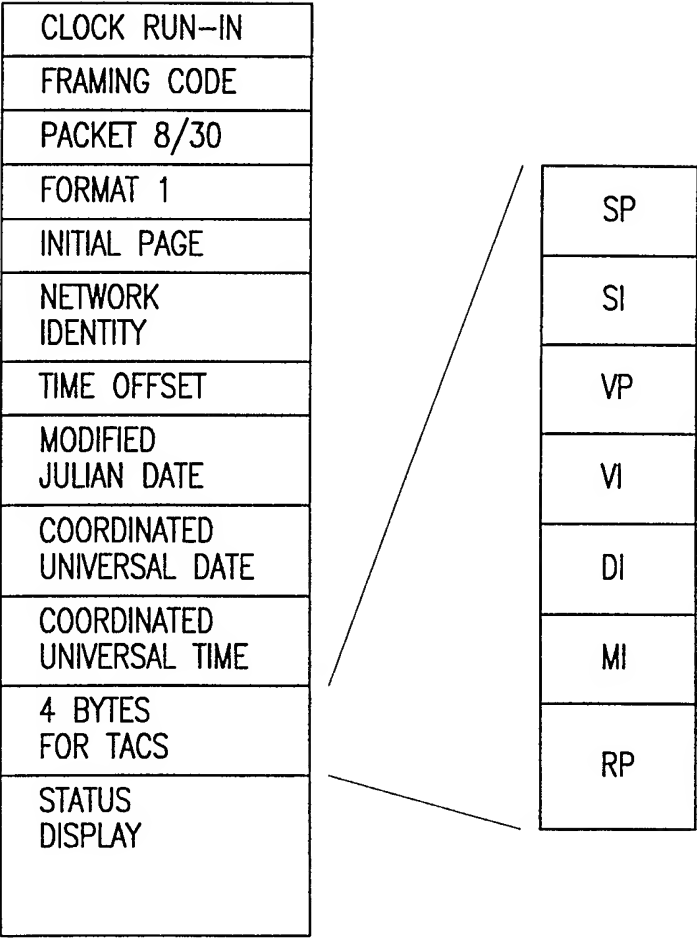


FIG. 3

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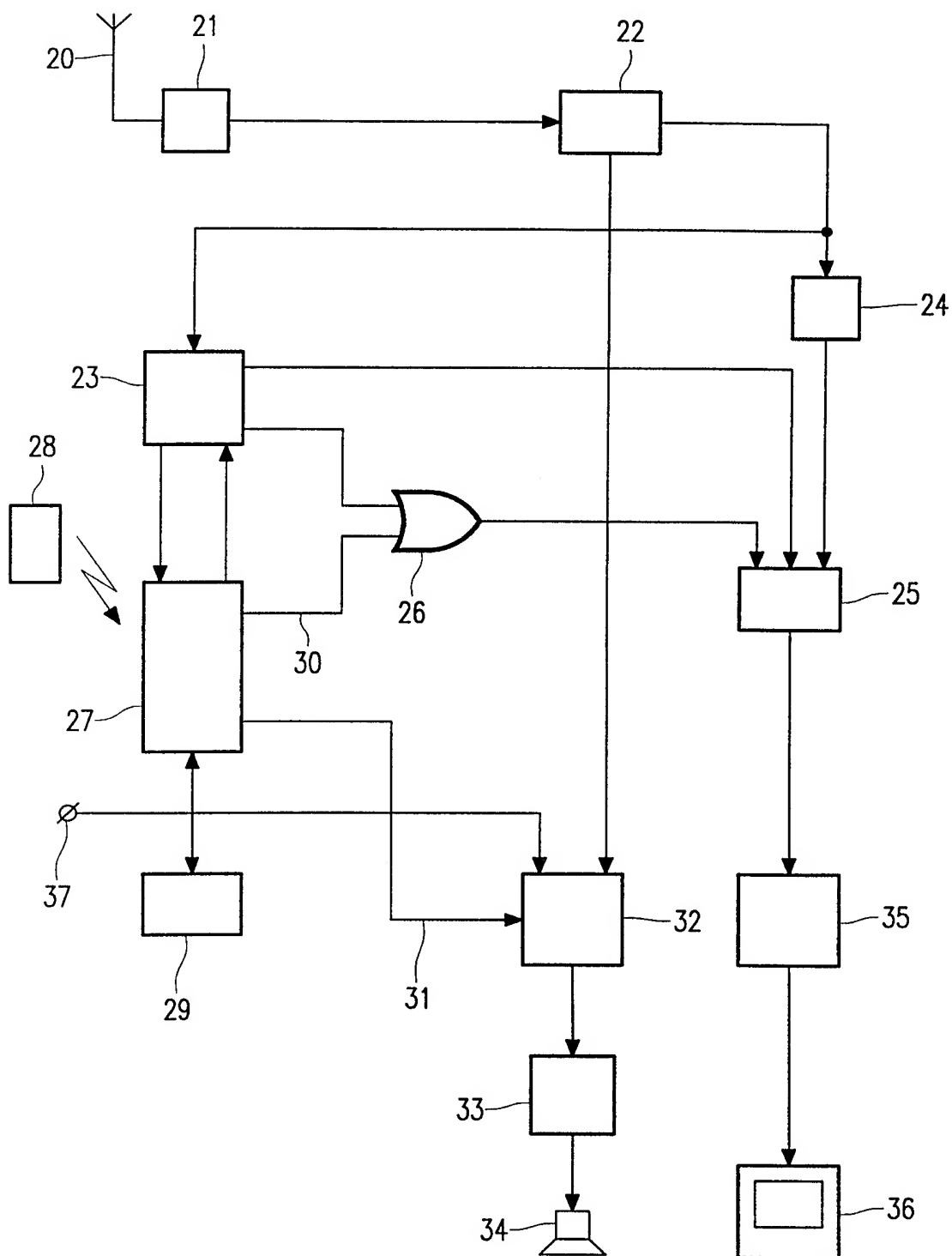


FIG. 4

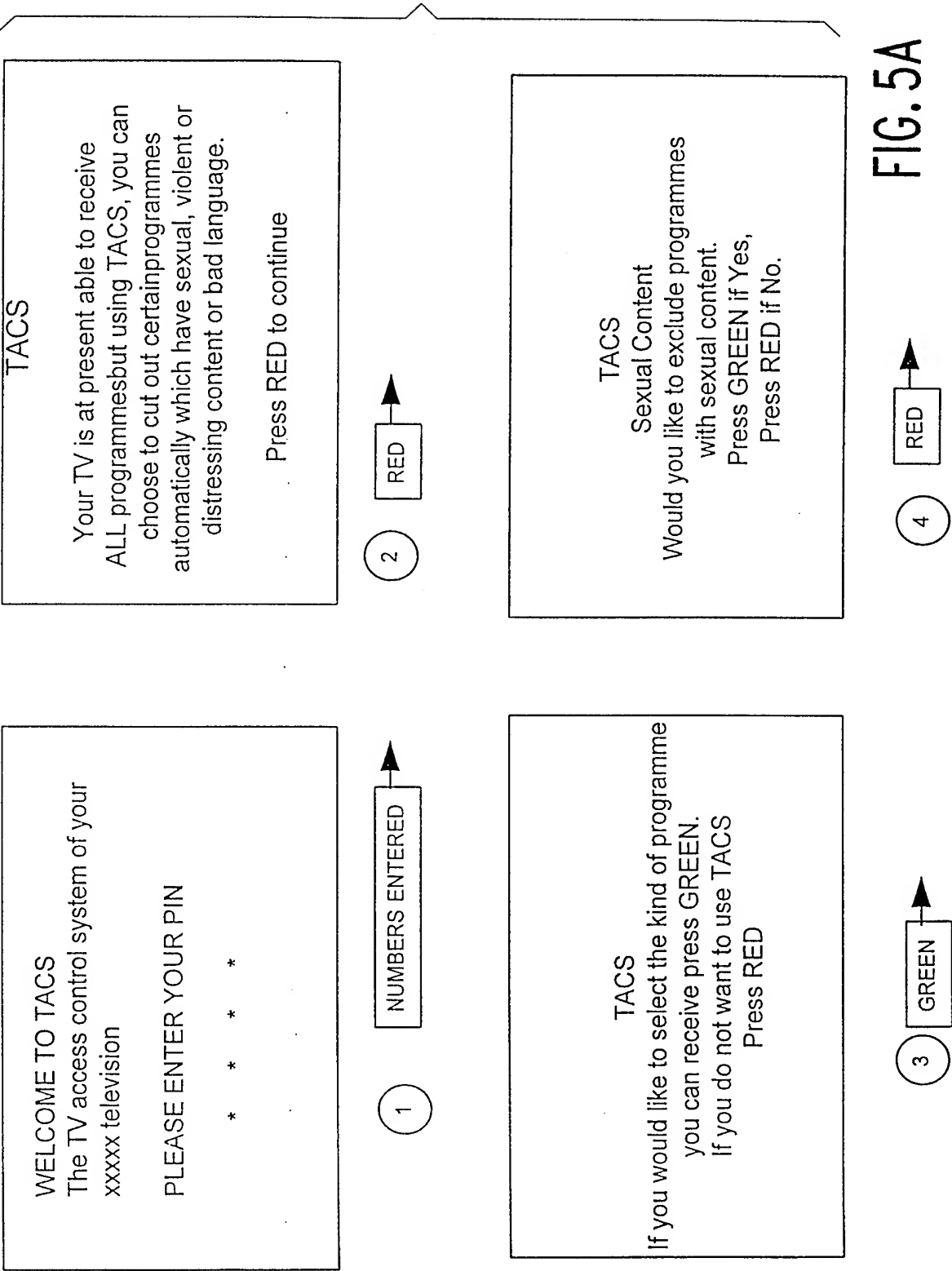


FIG. 5A

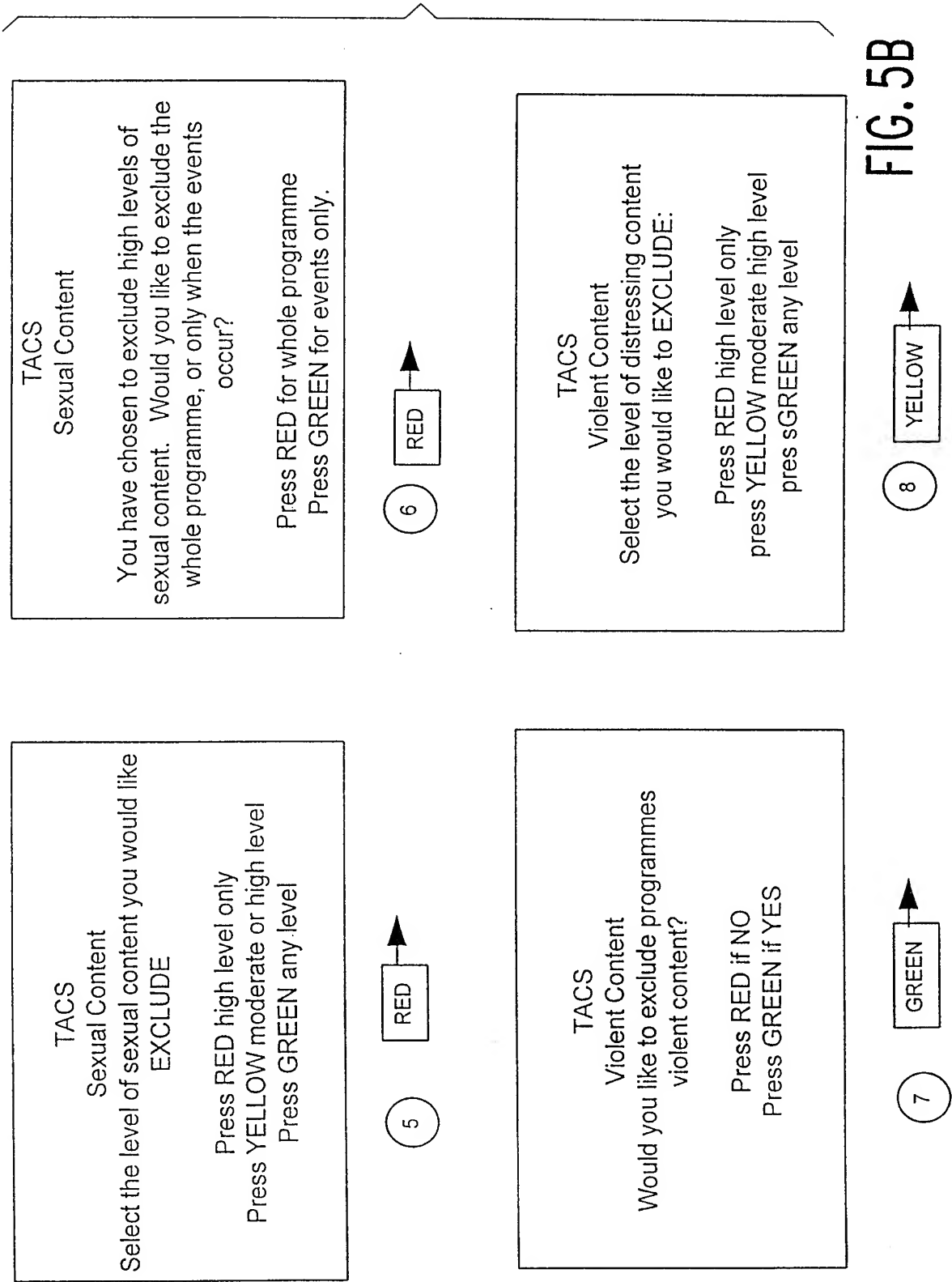
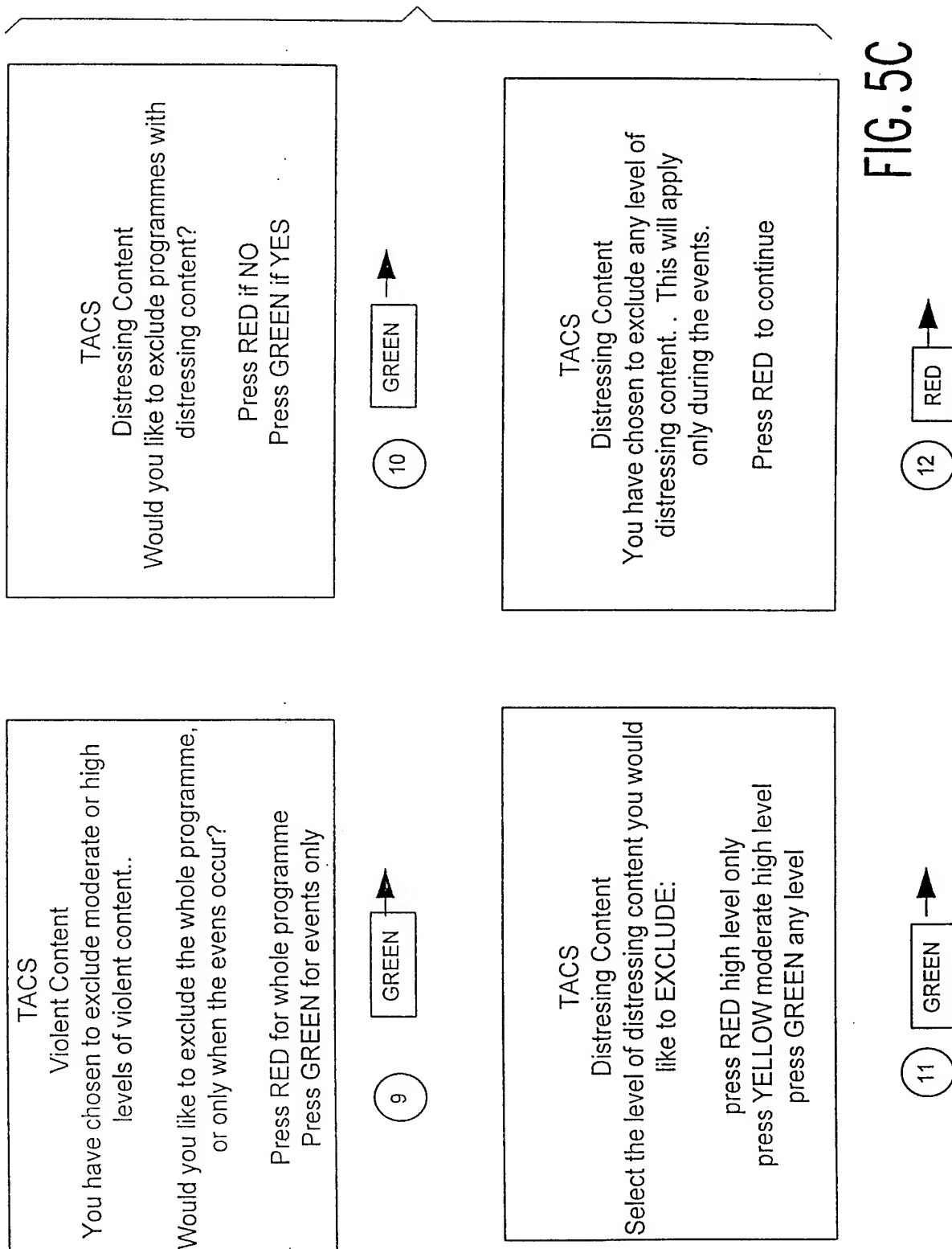


FIG. 5B

6/10



7/10

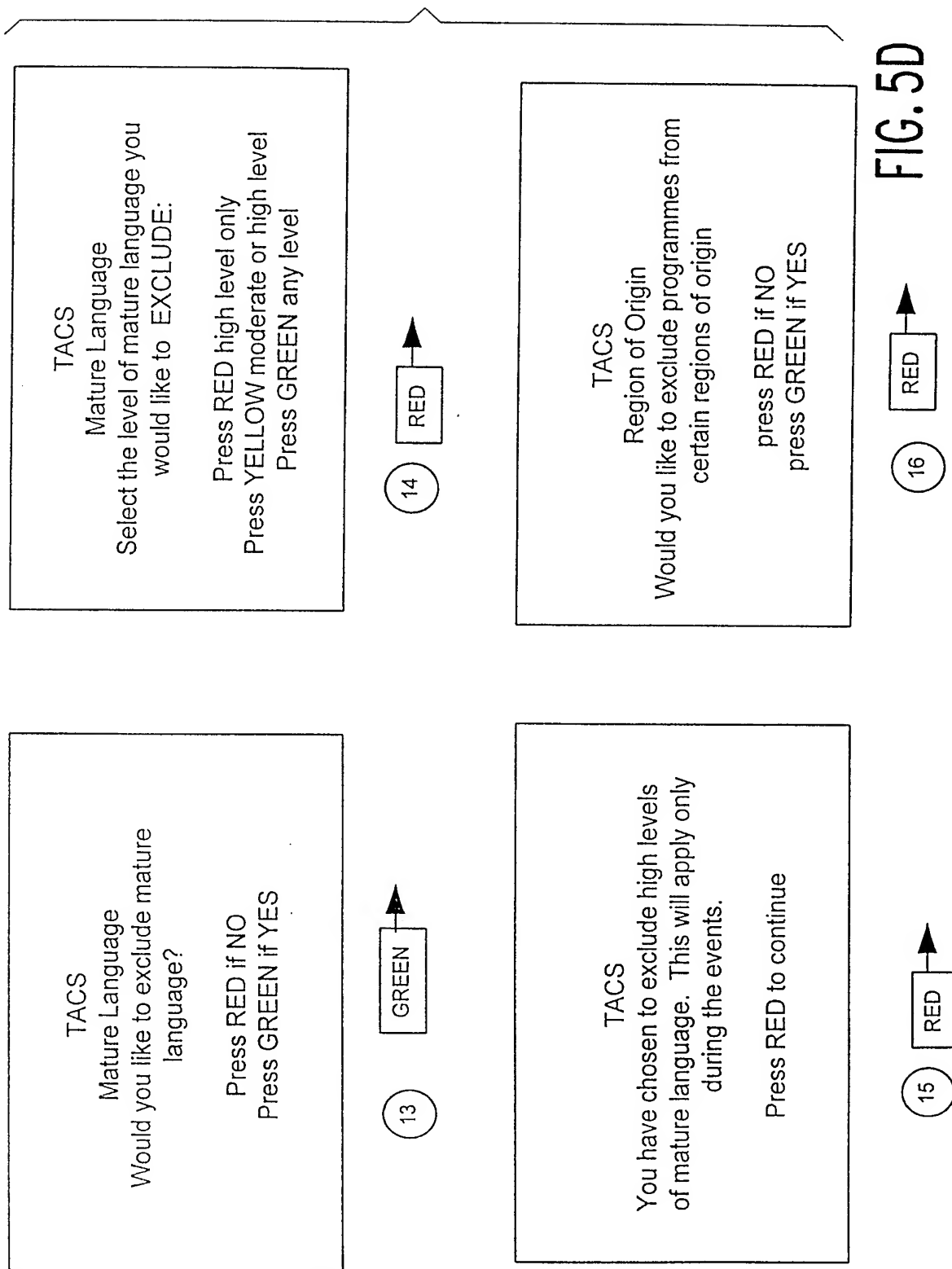


FIG. 5D

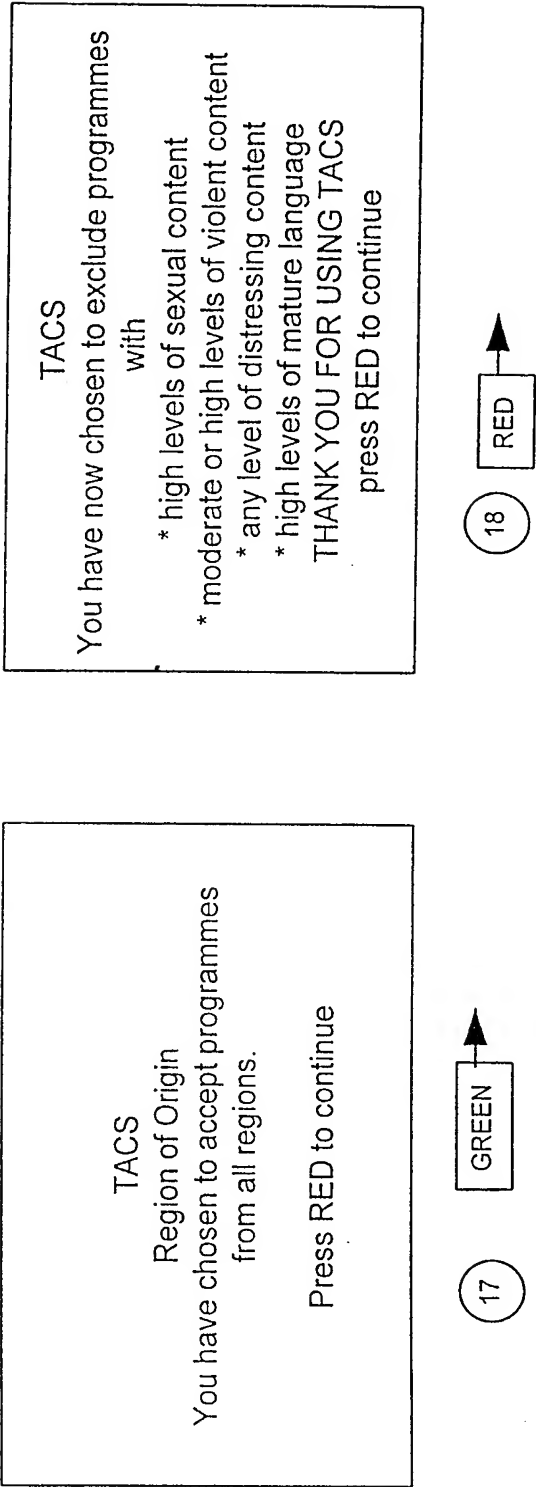


FIG. 5E

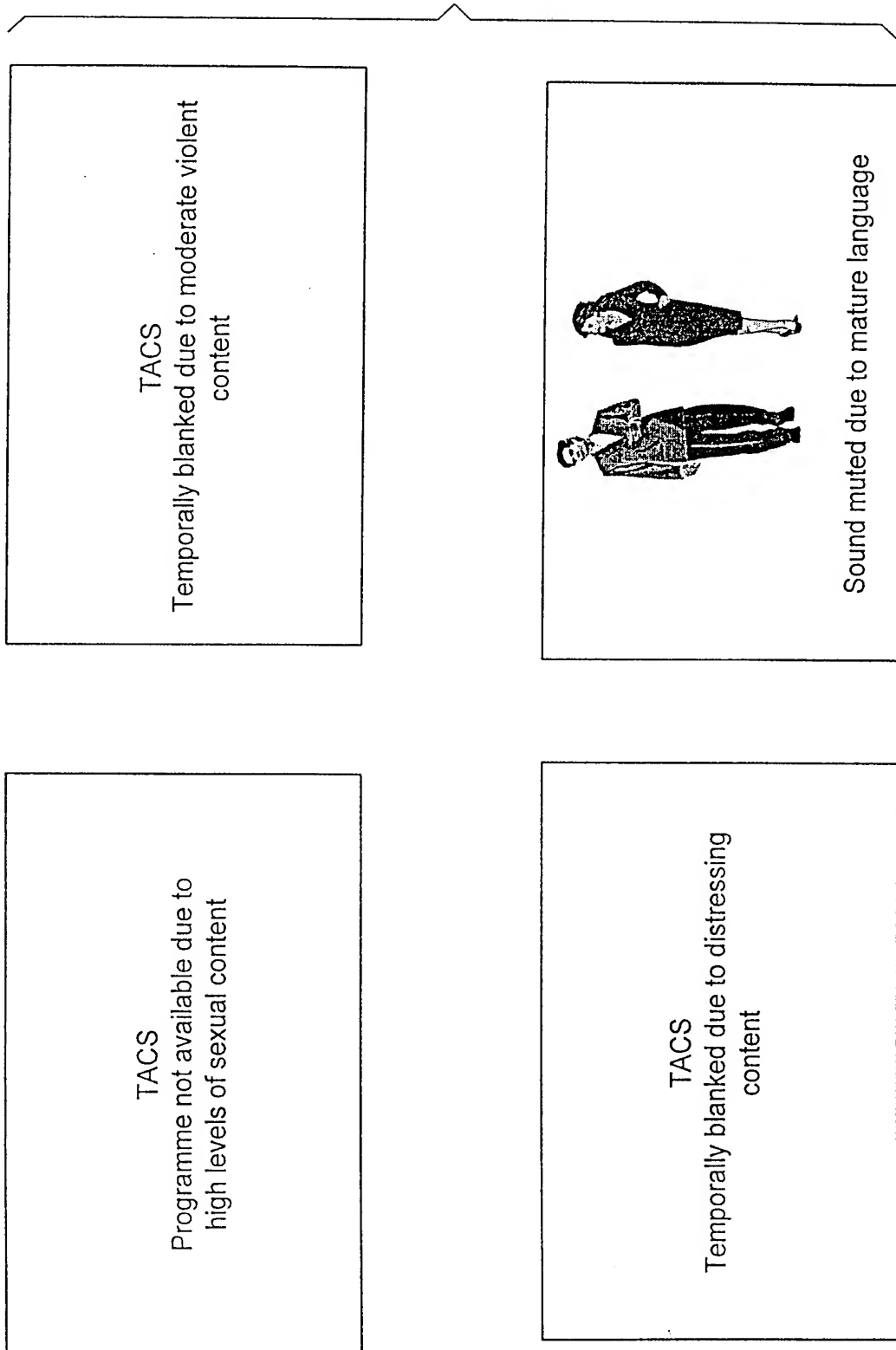


FIG. 6

10/10

Packet	
0	P134 Teletext 134 11 Nov 1996 22:10:17
1	
2	Current programme: Silence of the Lambs.
3	
4	Film starring Anthony Hopkins. USA 1991.
5	
6	Description, etc
16	WARNING: This programme contains scenes
17	of violence and mature language which
18	some viewers may find offensive.
19	
20	Language content.....4 Severe
21	Sexual content.....2 Low-medium
22	Violent content.....5 Extreme
23	Age classification..18

Column: 0123456789111111111222222222223333333333
012345678901 234567890123456789

FIG. 7a

Packet	
0	P134 Teletext 134 11 Nov 1996 22:10:17
1	42518
2	Current programme: Silence of the Lambs.
3	
4	Film starring Anthony Hopkins. USA 1991.
5	
6	Description, etc
16	WARNING: This programme contains scenes
17	of violence and mature language which
18	some viewers may find offensive.
19	
20	Language content.....4 Severe
21	Sexual content.....2 Low-medium
22	Violent content.....5 Extreme
23	Age classification..18

Column: 0123456789111111111222222222223333333333
012345678901 234567890123456789

FIG. 7b